WP 5

Guidelines for business sector involved in Blue Economy

Work Package 5 – Innovative exploitation of Adriatic reef for Blue Economy
Activity 5.2 – Definition of common guidelines for reef's users
Deliverable D5.2.1

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ABBREVIATIONS

EU	European Union
ROC	Republic of Croatia
NN	Narodne novine (The Official Gazette)
MOA	Ministry of Agriculture (Croatia)
HSŠRM	Hrvatski saveza za športski ribolov na moru (Croatian Federation for Sport Fisheries at Sea)
MAES	Mapping and assessment ecosystem services
MEA	Millenium ecosystem assessment
Mipaaf	Ministry of Agriculture, Food and Forestry Policies (Italy)
ESA	Ecosystem services approach
CICES	Common International Classification of Ecosystem Services
NA	Not Available

INTRODUCTION

1.1 Why are the Guidelines necessary

Submerged reefs, both natural and artificial, are important habitats of hard substrates in the sea, inhabited by various animal and vegetal communities, which are generally characterised by great biodiversity. The reef's users are attracted by its structure, life on the reef, and sometimes archaeological sites in the reef zone. The most frequent reef users are divers, swimmers who freedive, as well as professional and recreational fishers f. In specific cases, aquaculture can take place in the area of the reef or nearby. However, using the reef can significantly impact those reef features that attract the users. They can damage the reef structures, reduce biodiversity, reduce the presence of certain species, and engulf the reef with waste. The users of the reef are usually members of diving, recreational fishing, or professional fisheries associations. Given that they are often connected on social media, this is a chance to learn about the rights and formal obligations of using the reefs. On the other hand, learning about reefs' values and calling for responsible behaviour can contribute to the sustainable long-term use of these valuable habitats.

1.2 Who needs the Guidelines

The reef's users (legal entities and single people) who conduct activities on the reef need these Guidelines. In addition, the Guidelines are necessary for the organisers of reef visits, for all those actors who use the reefs to expand the local tourism offer such as excursion organisers, tourist boards, and tourist agencies, as well as for the fishing associations that organize fishing competitions. Legislative bodies and administrations can find the Guidelines useful when issuing regulations, especially those dealing on the exploitation of natural marine resources.

The Guidelines will familiarise the users with the fundamental legal obligations of the reef's use and warn them on possible harmful effects of conducting activities on the reefs.

1.3 How to use the Guidelines

These Guidelines are not a self-contained document that allows access to the reef's use without consulting the rights and obligations arising from the regulations on individual activities. The Guidelines should be used to broaden users' knowledge required for legal, legitimate, and responsible conduct of activities on the reefs. In that sense, they will provide the necessary information for legal management of activities as well as the basis for good practices of conducting activities on the reef. The Guidelines refer to the formal competence of individual governing bodies. It means that one should approach those bodies and collect more detailed information on the rights and obligations arising from their competences.

2. WHAT IS A SEA REEF

2.1 Definition of sea reefs

2.1.1 Types of reefs

Reefs can be natural or artificial. Adrireef project partners in the Adriatic Sea have identified Forty-seven artificial reefs, and they are present only in the Italian waters. The remaining reefs are natural, and most of them are in the Croatian waters. A total of 109 wrecks, 87 in the Italian territorial waters, 9 in Croatian territorial waters, and the remaining ones in international waters, were also listed.

2.1.1.1 Natural reefs (NRs)

The definition of NRs adopted in the context of the ADRIREEF project is: “Natural reefs are either biogenic or geogenic formations protruding from the solid or soft seabed with distinctive living marine resources” . The definition includes occasionally submerged but also permanently submerged reefs and it is not strictly related to the safety of navigation (Zec et al., 2019).

2.1.1.2 Artificial reefs (ARs)

As for the ARs, the following definition has been adopted within the Adrireef project: “An artificial reef is a submerged natural or manmade structure deliberately constructed or placed on the seabed

to emulate some functions of a natural reef such as protecting, regenerating, concentrating, and/or enhancing populations of living marine resources, while doing “no harm.” Objectives of an artificial reef may also include the protection, restoration and regeneration of aquatic habitats, and the promotion of research, recreational opportunities, educational use, sustainable fisheries and aquaculture.

This definition also includes decommissioned structures, or parts of them, intentionally topped down to act as an artificial reef (e.g., rig-to-reefs, sunken ships). The term excludes operational artificial islands, cables, pipelines, extraction platforms, mooring, structures for coastal defence (e.g. breakwaters, dikes, etc.), wind farms, etc. primarily constructed for other purposes. The term also excludes the Fish Aggregation Devices (FADs), employed to attract fish in certain fishing areas, and unless the submerged parts of such structures are not purposely planned and built to mimic some characteristics of the natural reefs, as a result of multi-actor joint eco-engineering aimed to optimize benefits from marine infrastructures and space according to the Blue Economy (Zec et al., 2019).

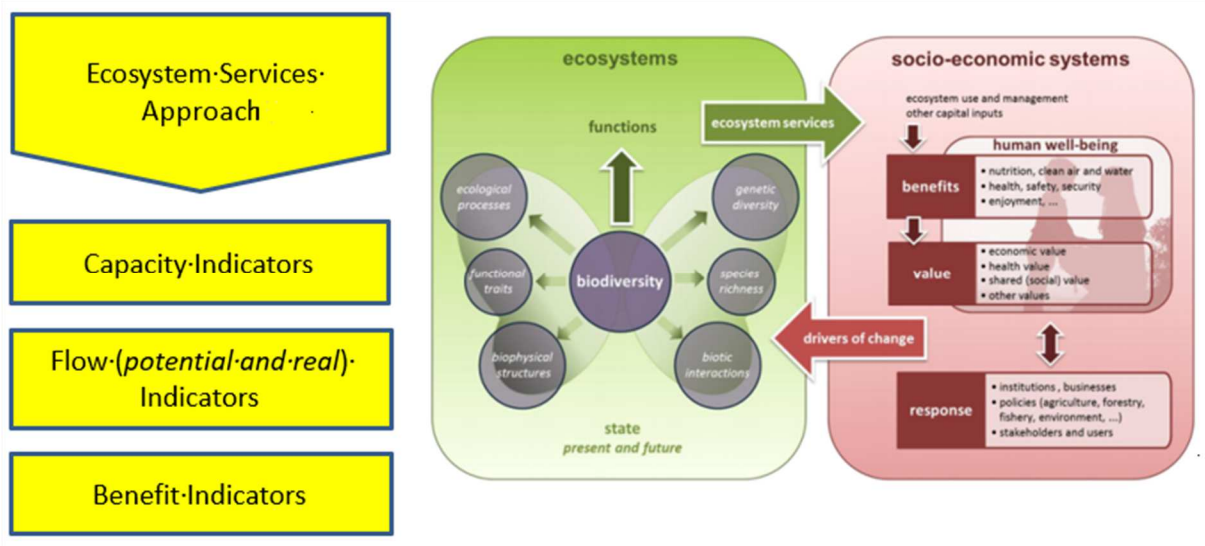
While most of the Adriatic artificial reefs have been installed in Italy, in the Republic of Croatia they are mostly related to wrecks. Along the Croatian coast, an artificial reef was installed within the “Adri.SmArtFish” project implemented by the Administrative Department for Agriculture, Fisheries, Water Management, Rural and Island Development of the Zadar County, and the Interreg V-A Italy Croatia programme, funds it. It is also planned to install an artificial reef in the coastal area of the City of Umag in Istra County, and it should cover a total surface of 252 ha.


Ivana Nobilo / CROPIX

2.2 Ecosystem services related to the reefs

The fourth edition of the EU Blue Economy Report (EC, 2021) dedicated a special focus to quantifying costs and impacts of depletion of blue natural capital and ecosystem services, as well as benefits of their preservation, restoration and adaptation. Preserving and increasing natural capital is key to ensuring the provision of valuable ecosystem services, and for the EU to achieve the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (UN, 2015), as called for in the European Green Deal (EC, 2019) and in the EU Biodiversity Strategy for 2030 (EC, 2020). As emphasized by the EU Blue Economy Report's authors (EC, 2021), "The environment is the service provider that enables human society and the economy to exist and develop (p. 118)". This concept entirely reflects the ethos of the ecosystem service approach that aims to support ecosystem and biodiversity conservation policies and to recognize that there are unbreakable limits on using natural capital in order to avoid irreversible losses. Moreover, the EU Biodiversity Strategy to 2020, recognizing the dependence of the human species on nature for the supply of food, energy, raw materials, air, and water (EC, 2011), set its Action 5 to map and assess the status and economic value of ecosystems and their services across the EU and to promote recognition of their economic value in accounting and reporting systems across Europe.

In order to support Member States, the Mapping and Assessment of Ecosystem Services-MAES Working Group was established in 2013 with the aim of designing a coherent analytical framework as well as common typologies for ecosystems mapping and ecosystem services assessment. The suggested approach is structured around a conceptual framework that links human societies and their well-being with the environment and ecosystem services (Figure 1). The two systems, ecosystems and socio-economic system are connected: ecosystems provide a multitude of benefits to the socio-economic system, from food, to clean water, to flood protection, to cultural heritage. The two boxes exchange flows of energy and matter. One flow goes from the ecosystem to the socio-economic system and is called ecosystem services (ESs; green arrow).



Picture 1 Conceptual framework for EU wide ecosystem assessments (Source: modified from Maes et al., 2013)

Ecosystem services influence human well-being by increasing the benefits of humanity. People assign value to benefits by simply enjoying the landscape, the freshness of the water, the quality of the honey. However, many of these ecosystem services are severely threatened by human pressures, called drivers of change (red arrow). Institutions through policies and stakeholders through behaviour can take actions in order to reduce the impact of drivers of change (Maes et al., 2013).

Despite the importance of these services to people, many continue to take them for granted, being seen as free and infinite. However, it is now clear that the global degradation of ecosystems is reducing the services (ESs) they can produce (MA, 2005). The concept of ecosystem services provides a starting point for defining, monitoring, and evaluating these services, the Ecosystem Services Approach (ESA). The ESA is defined as having four common characteristics (Beaumont et al., 2018):

- *The ecosystem services are assessed based on their benefits to humans;*
- *The ecosystem services are provided by ecosystem processes and this relationship is made explicit;*
- *The approach requires interdisciplinary expertise and the engagement of stakeholders at multiple scales;*
- *The results of the approach can be incorporated into environmental policy and management decisions.*

The topic of natural capital, human-made capital and related ecosystem services was approached by the ADRIREEF project adopting the Ecosystem Services Approach (ESA), described here above, for estimating the capacity of project case studies to support relevant economic activities (professional fishing, aquaculture, diving and boat excursion). From the methodological point of view, the ecosystem services assessment was carried out by adopting the Common International Classification of Ecosystem Services (CICES) and related indicators (Haines-Young and Potschin, 2018). The CICES v5.1 defines 36 (biotic) ecosystem services in relation to the marine coastal water ecosystem. Based on the results obtained from the legal framework and stakeholder analysis, it was possible to narrow the list of potential ecosystem services to the followings:

- *Wildlife and their products (provisioning services). Under this ecosystem service, professional fishing, extensive shellfish culture and aquaculture activities are assessed (Section 5.3.1).*
- *Experiential and physical use of terrestrial and marine plants, animals, and landscapes in different environments (cultural services). Under this ecosystem service, recreational diving, recreational fishing and boat excursion activities are assessed (Section 5.3.2).*
- *Scientific services (cultural services). Under this ecosystem service, scientific activities are assessed (Section 5.3.3).*
- *Educational (cultural services). Under this ecosystem service, educational diving activities are assessed (Section 5.3.4).*

In addition, the CICES provides indicators to assess the value provided by ecosystems to the socio-economic system. Three levels of indicators are described:

- *Capacity, understood as the ability to provide a service by evaluating so-called capacity indicators;*
- *Flow, understood as the actual use of that service by evaluating so-called flow indicators;*
- *Benefit, understood as the socio-economic value perceived by the community in evaluating the so-called benefit indicators.*

Therefore, in order to evaluate the impact of the reefs on the socio-economic system, the capacity, flow and benefit indicators suggested by CICES were estimated. In particular, the following data were used:

- *Biological data collected during the case studies characterisation for the estimation of the capacity indicators and a part of the flow indicators;*
- *Socio-economic data collected through a survey on economic activities for the remaining part of the flow indicators and for the benefit indicators.*

The following SWOT (Table 1) summarised the main findings of such analysis:

Table 1 SWOT analysis of ecosystem services

Strengths	**Weaknesses**
Natural capital and ecosystem services. Reefs preserve high-value natural capital. Natural capital provides important ecosystem services for humans and Blue economy sectors, such as: • "Wildlife and their products" ecosystem service, which provides food for the humans and economic development opportunities for local communities. The added value of the NAR/reef's catch has been demonstrated (on average 43% of economic operators fish in the area for 24% of their annual fishing days; 43% said they sell reef fish at a higher market price). This could lead to a certification of local production. • "Experiential and physical use-recreation" ecosystem service, which provides the opportunity to directly experience the animal and plant worlds, terrestrial/marine landscapes in different environmental settings and that translates into economic opportunities for ecotourism and tourism. • "Education" ecosystem service, which provides opportunities for environmental education, including marine science programs for the public, formal and informal learning and nature-based, cognitive tourism. • "Scientific" ecosystem service, which provides researchers and academics with open-air laboratories where they can carry out research and monitoring activities and in which they can also include citizens through citizen science paths.	Legislative framework. The lack of a legislative framework even at local level does not facilitate the adoption of management plans, except when the site is part of a protected area or a Natura 2000 site. Uneconomic exploitation. The distance of these areas from the mainland and marine conditions often make their economic exploitation uneconomic.
Opportunities	**Threats**
Regulatory framework. Regulatory framework should include measures promoting activities with low or no environmental impact, especially those relaxing environmental pressure on natural reefs. Pushing Blue economy sectors. Stakeholders are carrying out activities in the reefs (considering the sample surveyed: 43% of the fishermen, 8% of the aquaculture economic operators, 75% of the recreational diving center, 64% of the educational diving excursion, 67% of boat rentals). Among those who do not yet carry out activities in the reefs but who would like to start an activity in the site in the future, the percentage is variable (47% of the fishermen, 17% of the aquacultural, 75% of the diving center, 75% of the recreational diving excursion, 58% of the educational diving excursion, 100% of boat rentals).	Lack of legal framework. Existing legal framework does not include natural reefs nor recognizes the importance the natural reefs deserve as natural habitats. Uncontrolled forms of exploitation. Existing legal framework (international, European national, regional and local) does not include artificial reefs in a way that covers the entire spectrum of possible uses. This can lead to uncontrolled forms of exploitation.

Nature-based Solutions. Although the use of artificial reefs for fish restocking remains the main purpose, other important results can be achieved, such as the fight against illegal trawling, the creation of environments where research activities can be carried out, enhancement in educational terms and enjoyment in its various forms (diving, sport and recreational fishing).	

Natural and artificial reefs can foster the sustainable economic development of a region by promoting research, employing the local population in innovative activities and offering visitors the opportunity to have a direct experience with nature, also from an educational point of view.

The great variability of natural and artificial reefs characteristics (i.e., geographical position, depth range, morphological complexity, geology) largely determines the associated benthic community that shapes the supported fish community at each case study. Among these, coralligenous communities represent a “hot spot” of species diversity in the Mediterranean Sea that attracts both scuba diver tourists and fishermen supporting local economies and communities. Artificial reefs support peculiar fish communities probably because of the geographical position and the depth range. As they are designed to protect the coastal areas from illegal trawling, there could be the possibility of granting the reef area to fishing associations to promote more sustainable activities such as small-scale fisheries and collection o f edule bivalves naturally settled on the substrates. In addition, there is the possibility of using the artificial reef areas and wrecks for recreational purposes such as recreational fishing and diving. In particular, the wrecks are usually excellent fishing spots, as areas of refuge preferred by many species of fish, as well as fascinating underwater places to discover through diving activities.

The stakeholder analysis carried out in the ADRIREEF project allowed to assess the scope and size of the main actors of the Blue Economy present on both the Italian and Croatian sides and allowed to

establish a reference point to support stakeholders in finding a strategy in line with the principles of sustainable development for the protection of reef's resources. Stakeholders are aware of the need to find a balance between economic development and the long-term capacity of the sea through the implementation of sustainable practices. For these reasons, the main proposals that came from stakeholders implied that anthropic activities in general and economic activities in particular should be managed in a way that ensures the health and protection of reef areas, both natural and artificial, so that their services and potential can be implemented and sustained over time. The integration of these aspects and the collaboration between the various stakeholders would allow to fully exploit the potential offered by these precious habitats, also offering an excellent boost for the Blue economy.

The analysis of the legal framework revealed the most relevant weak point related to the conservation and enhancement of reefs. The lack of a coherent framework from the international to the local level undermines at its root a path that can in the case of natural reefs move towards a stage of conservation and enhancement in conservation of natural heritage. For what concerns artificial reefs, it would allow for consistency with Nature-based Solutions that are cost-effective, provide simultaneous environmental, social and economic benefits and help build resilience, thus benefiting biodiversity and supporting the provision of a range of ecosystem services.

The analysis of ecosystem services highlighted the value attributed to NAR/wrecks by economic operators engaged in the Blue economy sectors. Particular interest in economic exploitation was declared by diving centres for both recreational and educational diving, and by professional fishermen. Capture farmers showed very low interest, while Croatian economic operators organising boat trips stated some interest in promoting activities at reefs and wrecks as well. In terms of scientific value, NARs and wrecks provide researchers and academics with open-air laboratories where they can carry out research and monitoring activities and in which they can also include citizens through citizen science pathways. From the analysis of the data, this ecosystem service as well as food production and fruition still seem to have wide margins of valorisation.

2.3 Activities conducted on the reefs

2.3.1 Diving (snorkelling, freediving)

2.3.1.a) Croatian Side

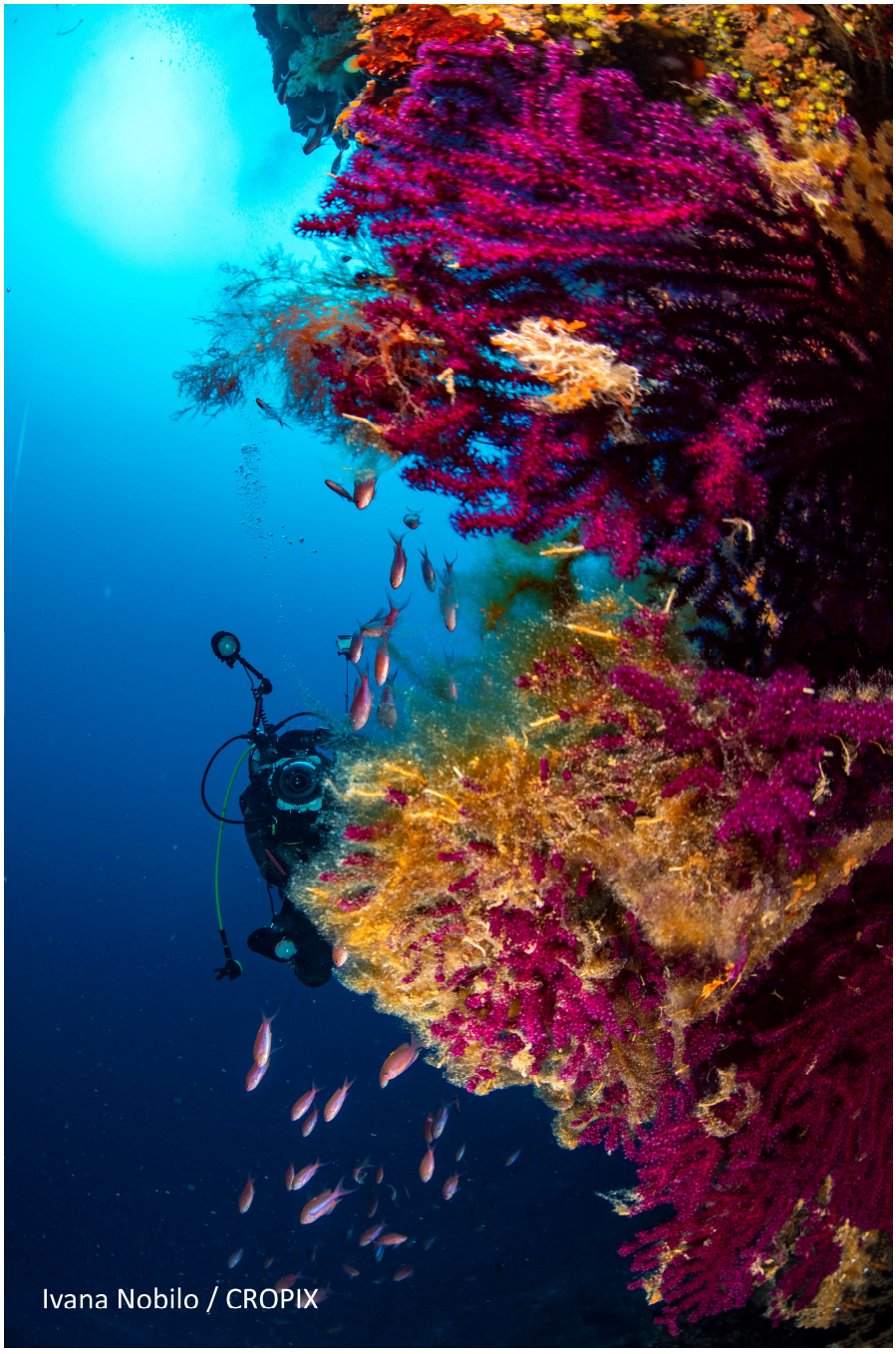
Diving in the internal waters and territorial sea of the Republic of Croatia for entertainment and sport purposes is regulated by the Regulation on conducting underwater activities (The Official Gazette, NN 47/99, 23/03, 28/03, 52/03, 58/03) and by the Decision to repeal the Article 5, of the Article 5a, paragraph 2 and Article 8 of the Regulation on conducting underwater activities (NN 96/10).

Diving for recreational and sport purposes can also be organised individually. Organised diving is possible if you are a member of a diving centre, diving association, or a legal or natural person registered to perform underwater activities in the Republic of Croatia. For individual diving, it is necessary to obtain Permission for individual diving issued by the competent port authority (Pula, Rijeka, Senj, Zadar, Šibenik, Split, Ploče, or Dubrovnik) or the port authority branch office. Stated permission is valid for one year from the date of the issue.

When diving, it is necessary to be informed on zones where individual diving is prohibited, which is defined by the Ordinance on the Procedure and Manner of issuing permits for undertaking underwater activities in the Inner Sea and Territorial Sea of the Republic of Croatia, which excludes areas where there is cultural heritage, and for which a specific permit shall be obtained (NN 49/19, ispr., 55/19). The stated regulation defines the draft of the Programme of undertaking underwater activities in the Inner Sea and Territorial Sea of the Republic of Croatia with cultural heritage.

Diving on cultural goods can be organised only by diving centres with the Ministry of Culture and Media permit. Every five years the Ministry of Culture and Media publishes a Tender to grant permits for conducting underwater activities on the cultural goods, the number of the permits is limited, and the fee is to be paid.

The programme defines the period in which the permit will be valid, the amount of compensation, protected areas – zones where diving is allowed, restrictions on the number of permits per zone, and code of conduct (prohibited touching of ammunition, cleaning safety nets, prohibition of entering the wrecks, etc.). The programme limits the number of divers on locations (maximum of 15 divers with one diving instructor) and diving can be performed only in line with the appropriate diving categories. It has to be stressed that in some locations, the competent Department of conservation can stipulate a smaller number of divers with one instructor if that is in the interest of protecting cultural goods. Depending on the assessment, if it is established that a protected area – zone is endangered by diving activities, the competent Department of conservation can suspend future activities on a particular location.



When talking about tourist diving, namely the diving centres business, it implies the tourists diving for leisure and underwater sightseeing. The tourist diving services imply guided diving, test dive, diving

courses, transport of tourist diver on the diving location, welcoming, keeping and maintaining diving equipment of the tourists, renting diving equipment (underwater breathing equipment, diving suit, and similar), filling pressure vessels with respiratory gases and other similar services for the tourist needs and it is regulated by the Act on the provision of tourism services (NN130/17, 25/19, 98/19, 42/20 i 70/21. Stated services can be provided by natural or legal persons determined by Art. 5 of paragraph 1 of the Act, and public institutions that manage protected areas in their jurisdiction registered to perform underwater activities, under the conditions stipulated by the same Act and other specific regulations that regulate performing of the underwater activity.

In addition, it is important to maintain and service scuba tanks and certify them and the diving compressor according to the recommendations of the equipment manufacturer.

2.3.1.b) Italian Side

In Italy at present there is no legal framework regulating diving recreational activities: diving can be exercised in compliance with national and international legislation. The rules in force refer mainly to the regulation of underwater fishing (art. 130 of the decree of the President of the Republic n. 1639 of the 02/10/1968for what concerns the safety of divers. The article is expressly referred to by art. 91 of the ministerial decree 29 July 2008, n. 146, as Implementing Regulation of article 65 of Legislative Decree 18 July 2005, no. 171.
In the same section III art. 90 obliges divers to use life-saving equipment and safety equipment on board of the pleasure crafts used as support units for sporting and recreational diving f. The recent Decree of the Ministry of Sustainable Infrastructure and Mobility, in force from the 1st of September 2021 has set the "communication of the start of support activities to scuba diving" (art. 8) and the "support activities for scuba diving" (art. 9). The Nautical-Code Legislative Decree 171/2005 has to be also taken into consideration. Any other restriction results from regional/local laws. **Therefore, before diving it is important to check the regional or municipal acts and the ordinances of the local Coast Guard.**
International, European and national "good practices" are also available, although they are voluntary and non-binding applied by divers (e.g. UNI EN ISO 24803:2018 on the requirements for recreational diving providers in the field of recreational scuba diving and snorkelling excursions).

Diving for recreational and sporting purposes can be organised individually or through diving centres or associations and ONLUS.

Individual diving is a free activity. Currently there is no legislation that provides the obligation of a diving licence to practice recreational diving, even if it is strongly recommended by the diving community. Likewise, a licence is not required to rent equipment or refill a cylinder. However, as a good practice, many diving centers apply for a diving licence to refill cylinders.
Organized diving is possible through a diving center, with an association if member or with a natural person, registered within the Chamber of Commerce, Industry, Crafts and Agriculture as the diving center and diving training activities for those who practice diving for sports or recreational purposes.
Before starting any diving activity, the organisation “having a permanent establishment in the territory of the European Union, which intends to use boats in support of scuba diving, presents to the competent maritime or inland water authority by territory or, if different, to that in which usually pleasure craft stationed, appropriate communication of commencement of business” pursuant to the President's decree of the Republic 28 December 2000, n. 445, on form compliant with Annex 1 (Decree of 1st September 2021, art. 8). Underwater assistance operators on board (guide or instructor with a licence issued by a national and international federations or recognized associations) take care of a register, endorsed by the maritime authority or by competent inland waters. Diving equipment must be maintained in perfect working order and equipped with testing certificates and periodic reviews required by current regulations (art. 8. par. 3; art. 9.). Furthermore, according to the cases, the laws may provide for the need to have a reserve cylinder, the cylinder with oxygen, the station of decompression, first aid kit and a person on board qualified for underwater first aid. Local regulations may also establish for safety purposes, and indirectly environmental protection, the maximum number of divers for each gGuide.
With regard to the accessibility of diving sites, the port authorities issue special provisions where the site is located.
In general, a relevant qualification certificate issued by a competent professional figure is strongly recommended for cave or wreck diving. Moreover, it is often compulsory to have a guide capable of evaluating the practicability in relation to the conditions present on the site to visit.
A separate discussion is represented by diving in Marine Protected Areas (MPA) or areas of archaeological interest. The importance of the MPAs is now widely recognized both scientifically and politically but also economically and socially. An MPA represents a real resource for the socio-economic and cultural development of a territory and activities such as diving can be promoted in compliance with the protection and safeguarding of marine heritage. Each internal regulation can indicate the types of activities allowed (e.g. snorkelling, seawatching, freediving, didactic activities, individual diving and/ or guided, underwater photos, underwater shooting, educational activities) and how they are disciplined into the areas with different degrees of protection (Zones A, B and C, L. 6/12/1991 n. 394). In general, in zone A diving is not allowed and never authorised at night, the maximum daily number of visits is also indicated as well as the number of participants allowed, the time of year and the daily timetable, while in zones B and C the restrictions are loosened. A similar regulation can also be found in protected archaeological sites.

For a sustainable use of the reef areas, research institutes according to the procedures established by the manager can carry out periodic monitoring of the impacts and the state of conservation of the habitat. In this sense, every diver or diving centre can get information and provide his own contribution, also through citizen science projects.

2.3.2 Research activities

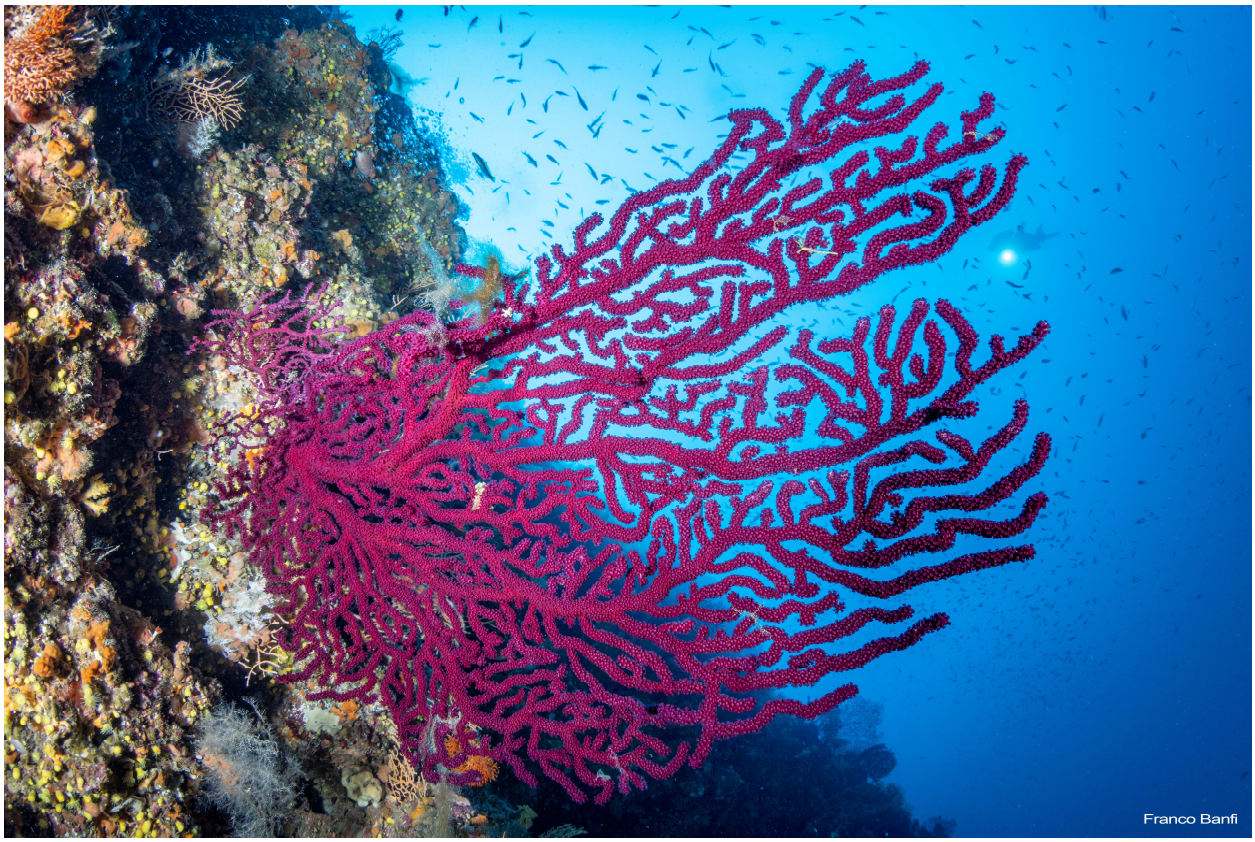
Being Italy and Croatia EU member states, when the research activity involves scientific fishing on board of professional vessels it is subject to the art. 25 of the EU Reg. 1241/2019: the fishing operations have to be carried out with the permission and under the authority of the flag Member State:

a. the Commission and the Member State in the waters under the sovereignty or jurisdiction of which the fishing operations take place ('the coastal Member State') have to be informed at least two weeks in advance of the intention to conduct such fishing operations detailing the vessels involved and the scientific investigations to be undertaken;
b. the vessel or vessels conducting the fishing operations must have a valid fishing authorisation in accordance with Article 7 of EU Regulation n. 1224/2009;
c. if requested by the Member State, the master of the vessel is required to take on board an observer from the coastal Member State during the fishing operations, unless this is not possible for security reasons;
d. fishing operations conducted by commercial vessels for the purpose of scientific investigation have to be limited in time. When the fishing operations conducted by commercial vessels for a specific research involve more than six commercial vessels, the Commission must be informed by the flag Member State at least three months in advance and shall seek, where appropriate, the advice of STECF to confirm that this level of participation is justified on scientific grounds; if the level of participation is not considered justified according to the advice of STECF, the concerned Member State shall amend the conditions of the scientific research accordingly;
e. in the case of electric pulse trawl, vessels conducting scientific research must follow a specific scientific protocol as part of a scientific research plan that has been reviewed or validated by ICES or STECF, as well as a system for monitoring, control and evaluation;
f. marine species caught for research purposes may be sold, stored, displayed or offered for sale, provided that they are counted against quotas in accordance with Article 33(6) of Regulation (EC) No 1224/2009, where applicable, and:
g. they meet the minimum conservation reference sizes set out in Annexes IV to X to the EU Regulation n. 1224/2009; or they are sold for purposes other than direct human consumption.

2.3.2.a) Croatian Side

Scientific research in the internal waters, territorial sea, and exclusive economic zone of the Republic of Croatia can be conducted by local and foreign legal entities and natural persons, and Croatian warships only with the approval of the Ministry responsible for maritime affairs (Art. 13 Maritime Code NN 181/04, 76/07, 146/08, 61/11, 56/13, 26/15, 17/19). It concerns testing, imaging, and/or measuring the seabed and/or subsoil. As an exception from the stated above, the public scientific institution based in the Republic of Croatia can conduct research in the internal waters and territorial sea of the Republic of Croatia with the consent of the competent port authority (Maritime Code NN 181/04, 76/07, 146/08, 61/11, 56/13, 26/15, 17/19).

Fishing or harvesting of fish or other marine organisms for scientific purposes within Croatian waters is subject to a special licence (Article 55 of the Marine Fisheries Act of 1994 as amended by OJ 57/96 and 48/05) that has to be required to grant exemption under the fisheries laws and regulations for scientific purposes such as use of prohibited fishing gear or fishing in prohibited areas.



Pursuant to the Nature Protection Act (NN 80/13, 15/18, 14/19, 127/19), Article 145, a legal and natural person who intends to conduct scientific and/or professional research of the nature components in the protected area is obliged to obtain permission. The application for research permission needs to contain information on: contractor, research, research location, research purpose, duration and period of conducting research, research methods, used equipment, tools, machines, and others. The competent authority issues the permission with a 5-years deadline if they determine that the research will not change the features for which the area is protected. The permission contains conditions of the nature protection, the deadline for which it is issued, and notification for report submission or research results. The inventory and monitoring of the state of nature conservation in the protected area, which does not include the use of invasive methods on the individuals of the strictly protected species and is conducted by public institutions for public areas management according to the standardised methodology and protocol by Ministry, are not considered research in the sense of article 145.

Fishing for scientific purposes can be allowed only to natural and legal persons who are registered for the performance of such activity. It may be performed only pursuant to a decision issued by the MOA. The Ministry determines the conditions under which fishing may be performed for this specific fishing category. AS for scientific fishing in areas protected under a special law, it is necessary to obtain authorisation on the conditions of nature protection issued by the ministry responsible for nature protection affairs.

2.3.2.b) Italian side

In Italy, scientific research in all fields is allowed to universities, public bodies in charge, public and private laboratories or research institutes recognised by the Ministry of University and Research. The Ministry of Agriculture, Food and Forestry Policies (Mipaaf) prepares the list of Institutes recognized by Decree that can carry out research activities in the field of maritime and inland fishery with adequate structures, means and professional profiles (D.P.R. n. 1639 of the 02/10/1968).

During the sampling campaign at sea all, the safety requirements for work and navigation must be respected. In this regard, the boarding of scientific personnel must be requested from the Port Authorities responsible for controlling the concerning area. This request must specify:

- description and purposes of the research;
- sampling area;
- list of the scientific personnel onboarding;
- stability tests of the vessels used;
- safety equipment on the vessels used.

The following additional information have to be provided in the case of experimental fishing surveys:

- fishing gears and fishing methodology that will be used for the Scientific Fishing (in the case of fishing research);
- duration of the fishing activities needed for the research;
- fishing vessels or motorboats that will be used;
- crew roster of the fishing vessels.

Each sampling cruise for scientific purposes must be communicated at least 24 hours before by mail, fax or phone to the Port Authorities.

2.3.3 Commercial fishing (small and professional fishing)

Based on the EU Reg. 2017/1004 of the European Parliament the 'fisheries sector' includes those activities related to commercial fisheries, recreational fisheries, aquaculture and industries processing fisheries products. Commercial fishing is all activities aimed to collect marine organisms for economic purposes. It is regulated by the EU Reg .n. 1967/2006 of the Commission of 21 December 2006 concerning the management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea and amending EU Reg. n. 2847/93 and repealing the EU Reg. n. 1626/94, and by the EU Reg. n. 2019/1241 of the European Parliament and of the Council on the conservation of fisheries resources and the protection of marine ecosystems through technical measures.
For the use of fishing gears in commercial fishing, significant spatial restrictions have been established, such as for example:

- fishing with shore seines is regulated by the management plan that identifies locations along the coast in which this type of fishing is permitted;
- the use of trawling gears is prohibited within a distance of 3 nautical miles from the coast or within the 50 m isobath when that depth is reached at a shorter distance from the coast (Art. 13, point 1, Eu Reg. n. 1967/2006);

- the use of trawling nets is prohibited within a distance of 1.5 nautical miles from the coast;
- the use of dredges pulled by boats and hydraulic dredges is prohibited within a distance of 0.3 miles from the coast (Art. 13, point 2, EU Reg. n. 1967/2006);
- the use of trawling gears is forbidden on meadows of Posidonia oceanica or other sea grasses, on coralligenous habitats and mearl beds, on bottoms below 1000 mt depth;
- the use of purse seines is prohibited within a distance of 300 mt from the coast or within the 50 mt isobath when this depth is reached at a shorter distance from the coast (Art. 13, point 3, Eu Reg. n. 1967/2006).

On the reefs occurring in the protected coastal area within 300 mt from the coastline, which are not included in MPAs, marine commercial fishing can be performed using gill nets, traps, angling and spear fishing gears and special methods of fishing (for types of commercial fishing in which diving is allowed).

Several other technical measures regard the fishing gears and the catch of particular species. The measures mostly related to common fishing activities at reef sites are reported here below:

- the length of purse seines and seines without purse lines is restricted to 800 mt with a drop of 120 mt, except in the case of purse seines used for directed fishing of tuna;
- it is prohibited to use the following static nets: trammel net with a drop of more than 4 mt; bottom set gillnet or combined trammel and gillnet with a drop of more than 10 mt except when such nets are shorter than 500 mt, where a drop of not more than 30 mt is permitted;
- it is prohibited to use any gillnet, entangling net or trammel net constructed with a twine thickness greater than 0.5 mm;
- it is prohibited to have on board or set more than 2500 mt of combined gillnets and trammel nets and 6000 mt of any gillnet, entangling net or trammel net;
- it is prohibited for vessels fishing with bottom-set longlines to have on board or deploy more than 5000 hooks except for vessels undertaking fishing trips of more than 3 days which may have on board or deploy no more than 7000 hooks;
- it is prohibited for vessels fishing with surface-set longlines to have on board or deploy more than the number of hooks per vessel as follows: (a) 2500 hooks when directed fishing for swordfish; (b) 5000 hooks when directed fishing for albacore tuna;
- a vessel undertaking fishing trips longer than 2 days may have on board an equivalent number of spare hooks;
- It shall be prohibited to have on board or set more than 250 pots or creels per vessel to catch deepwater crustaceans.
- the directed fishing for red sea bream (Pagellus bogaraveo) with the following gear is prohibited: gillnets, entangling nets or trammel nets having a mesh size of less than 100 mm; longlines with hooks of a total length of less than 3.95 cm and a width of less than 1.65 cm;
- it is prohibited to fish with spear guns if used in conjunction with underwater breathing apparatus (aqualung) or at night from sunset to dawn.

Compliance with the minimum sizes of marine organisms (EU Reg. n. 1241/2019 and 1967/2006) must be respected in commercial fishing.
In the Mediterranean sea it is forbidden to fish for, retain on board, tranship, land, store, sell, display or offer for sale a range of species such as: berried female crawfish (Palinurus spp.) and berried female lobster (Homarus gammarus) in the Mediterranean Sea except when used for direct restocking or transplantation purposes; (o) date shell (Lithophaga lithophaga), fan mussel (Pinna nobilis) and common piddock (Pholas dactylus); (p) hatpin urchin (Centrostephanus longispinus).

2.3.3.a) Croatian Side

In addition to the above reported EU Regulations, in the Republic of Croatia, **p**ursuant to Marine fisheries act (NN 62/17, 130/17, 14/19) fishing is "the authorised catch and collection of fish and/or other marine organisms, and is divided into commercial, small coastal, sports, recreational, scientific and scientific educational fishing purposes, and fishing for the purposes of aquaria open to the public and fishing tourism". All the stated types of fishing are possible on reefs.

Commercial fishing, fishing tourism, and small coastal fishing belong to the category of economic activities, while sport and recreational fishing to the categories of non-commercial fishing. Scientific and scientific educational fishing purposes, and fishing for the purposes of aquaria open to the public are the special fishing categories.

Commercial fishing in Croatia "may be performed by the authorised holder of the marine commercial fisheries licence, or the authorised holder of the small coastal fisheries licence, using a vessel, fishing gear, fishing diving equipment, and in the fishing zones as are listed on the licence." Marine commercial fisheries licence is issued by the Ministry of Agriculture (MOA). The licence issuance implies the whole range of formal requirements preceding the issuing. In every county, the MOA has open local units, which the interested users can contact and obtain all the necessary information.

In specific cases of compliance with the *acquis communautaire*, to perform commercial fishing, in addition to the licence, authorisation is required as well. The authorisation is issued to "the authorised holder of the commercial fisheries licence thereby permitting the performance of fishing on the vessel listed in the licence, using the specific gear listed in the licence and in a specific area, and may include specific species of fish and other marine organisms". The authorisation is issued for the specific types of fishing within the management plans (shore seines, bottom trawls, and purse seines).

Besides the EU regulations, additional management rules have been set up to manage the fishing resources and the fishing effort. Mesh sizes of nets and other fishing gears as well as their area and time of use have been determined in Regulation on Commercial Fishing (6/06, 46/06, 66/07) and in the Regulation on fishing gears and tools in commercial fisheries (6/06, 46/06, 93/06) (https://www.faoadriamed.org/html/legislation/LegCROComp.html).

2.3.3.b) Italian Side

In Italy, the Ministry of Agriculture, Food and Forestry Policies (Mipaaf) issues the licence for marine commercial fisheries licence. The licence issuance implies the whole range of formal requirements preceding the issuing.

The biological temporary fishing stop is a measure instituted by the Italian Government that regulates fishing during the reproductive periods of the main marine organisms on the market. The fishing

temporary stop focuses mainly on invasive fishing systems (bottom and pelagic trawling) to ensure the protection of marine fauna. The beginning and the duration of the fishing temporary stop in the Italian seas may vary according to the areas and coasts, being generally:

- from 26 July to 6 September in the north-western Adriatic, from Trieste to Rimini;
- from 16 August to 27 September in the south-western Adriatic, from Pesaro to Bari.

Every year the Mipaaf issues the ministerial decree specifying the dates of the fishing temporary stop.

Moreover, the Italian Government has adopted the measure of the "Zone di tutela biologica (ZTB)" (art. 98 of the DPR 1639/1968) to protect reproductive and nursery areas of valuable commercial species and areas which have been depauperated by intense fishing. Differently from the MPAs, the ZTB are management measures aimed to recover and preserve commercial stocks rather than biodiversity. Because of this, they are only subject to fishing restrictions.
Based on the D.M. 22/01/2009 (Official Gazette of the Italian Republic n. 37 of the 14/02/2009), 12 ZTB have been established in the Italian seas; three of them are aimed to protect the submerged patch reefs of the northern Adriatic sea (Tegnùe), while another one includes the submerged rocky habitats surrounding the Tremiti islands (central Adriatic sea). The same decree forbids in each ZTB and all year round the fishing of juveniles of all species. Concerning the 4 ZTB dealing with submerged natural reefs the following measures are in force:

- ZTB of Miramare and ZTB of Chioggia: trawling is forbidden; set nets, purseines and recreational line fishing are subjected to spatial, temporal or gear restrictions;
- ZTB of Porto Falconera - Caorle: every kind of commercial and recreational fishery is forbidden;
- ZTB of Tremiti: temporal closure for bottom and pelagic trawling; set gears allowed; recreational line fishing subjected to gear restrictions.

2.3.4 Non-commercial fishing

Based on the EU Reg. 2017/1004 of the European Parliament the "recreational fisheries" means non-commercial fishing activities exploiting marine biological resources for recreation, tourism or sport.
As for the commercial fishing, also the non-commercial fishing is subjected to some overarching EU rules aimed to avoid overexploitation of the resources and depletion of habitats (EU Reg. n. 1967/2006 and EU Reg. n. 2019/1241).
Specifically:

- the use of towed nets, surrounding nets, purse seines, boat dredges, mechanised dredges, gillnets, trammel nets and combined bottom-set nets is prohibited for leisure fisheries;
- the use of longlines for highly migratory species is also prohibited for leisure fisheries;
- catches of marine organisms resulting from non-commercial fisheries cannot be marketed; nevertheless, by way of exception, the marketing of species caught in sportive competitions may be authorised provided that the profits from their sale are used for charitable purposes;
- in the Mediterranean sea it is forbidden to fish for, retain on board, tranship, land, store, sell, display or offer for sale a range of species such as: berried female crawfish (Palinurus spp.) and berried female lobster (Homarus gammarus) in the Mediterranean Sea except when used for

direct restocking or transplantation purposes; date shell (Lithophaga lithophaga), fan mussel (Pinna nobilis), common piddock (Pholas dactylus) and hatpin urchin (Centrostephanus longispinus);

- finally, in non- commercial fishing compliance with the minimum sizes of marine organisms (EU Reg. 1241/2019 and 1967/2006) must be respected.

2.3.4.a) Croatian Side

Non-commercial fishing is divided into two categories: sport and recreational fishing. Any individual, whether a Croatian or a foreign citizen, is permitted to perform them pursuant to require a sport fishing licence, or a marine recreational fishing licence. Sport fishing licences can be daily, multi-day, and annual. The licences are sold directly by the MOA at the local units, or in electronic form. The Ministry can authorise legal and natural persons to sell licences. By way of derogation, special licences for fishing in protected areas may be sold by the competent public institution, while sport fishing licences are sold by the Croatian Federation for Sport Fisheries at Sea. Many fishing associations are members of the Croatian Federation for Sport Fisheries at Sea, where the licence can be bought.

Ordinance on sport and recreational fishing at sea (NN122/17, 12/18, 54/18, 69/20, 125/20 and 87/21) prescribes to the authorised entities the sale of licences; sales of sport and recreational fishing licences, the record of the sold licences, the content of the contract on licence sales, the form of the submission of reports on the licence sales. In addition, it prescribes:

- types of licence;
- price of individual licence categories;
- allowed fishing gears, their quantity, and characteristics;
- minimum size of the species of fish and other marine organisms under which it is prohibited to catch, collect, keep on the vessel or discard;
- marking catches from sports and recreational fishing (to prevent them from being sold on the black market).

Sport and recreational fishing include the use of angling gears, with special licences that can be bought with the sport and recreational fishing licence, in the areas that are not protected. They can be performed with:

- bottom longline with up to 100 hooks;
- traps (up to 3 pieces)
- harpoons with the use of light;
- hooks for the catch of cephalopods with the use of light;
- angling gears for the catch of highly migratory fish species

Further restrictions concern the amount of catches: the total catch of molluscs cannot exceed 2 kg except for mussels whose catch can amount up to 5 kg (NN 122/2017); the total catch of fish cannot exceed 5 kg, except in case of a single specimen having a weight greater than 5 kg (NN 56/2010).

Fishing in the protected areas is regulated by the Regulation on fishing in protected areas, special habitats and areas with special fishing regulations (NN 125/2020).

Fishing for c educational purposes and fishing for the purposes of aquaria open to the public can be allowed only to natural and legal persons who are registered for the performance of such activities. It may be performed only pursuant to a decision issued by the MOA. The Ministry determines the conditions under which fishing may be performed for this specific fishing category. For fishing for educational purposes in areas protected under a special law, it is necessary to obtain authorisation on the conditions of nature protection issued by the Ministry responsible for nature protection affairs.

2.3.4.b) Italian Side

In Italy the Mipaaf Decree of 06/12/ 2010 (Official Gazette of the Italian Republic of 31 January 2011, n. 24) establishes that anyone fishing for sport or recreational purposes at sea must communicate the exercise of the activity to the aforementioned Ministry. This communication must be sent directly by the fisher or with the support of sport and recreational fishing associations by connecting to the institutional website of the Ministry (www.politicheagricole.it)). The validity of communications made pursuant to the Ministerial Decree of 06/12/ 2010 has been extended to 31 December 2022 by the Directorial Decree 5205 of 04/03/ 2020The licence obtained for sport or recreational purposes at sea is free of charge.
Time, area and gear restrictions apply to this type of activities (Presidential decree n. 1639/1968). In addition, individuals involved in sport competitions are required to be members of a national sport fishing federation and to report catch data.
Any kind of marketing of the fish caught during sport or recreational fishing is forbidden. Compliance with the minimum sizes of marine organisms (EU Reg. n. 1241/2019 and 1967/2006; D.P.R. n. 1639/68; EU Reg. n. 520/2007, 1559/2007 and. 643/2007; D.P.R. n. 1639/68; D.M. 3/5/89; D.M. 11/6/07; D.M. 5/5/89; D.P.R. n. 357/97; D.M. 11/6/07; D.M. 16/7/86; D.M. 30/11/96; D.M. 16/7/86; D.M. 12/1/95; EU Reg. 41/2007) must be also respected in sport and recreational fishing.
Sport or recreational fishing is allowed at a minimum distance of 500 mt from vessels involved in professional fishing activities and is forbidden in the presence of bathing people.
The sport fishers are allowed to catch:

- fish, molluscs (with the exception of bivalves), crustaceans - of minimum size foreseen by national and community legislation (see above) - in overall quantities equal to or less than 5 kg, except in the case of single fish of greater weight;
- a single specimen of grouper to any species it belongs;
- a single specimen of bluefin tuna per day with a minimum size not less than 30 kg or 115 cm in length;
- a single specimen of swordfish per day with a minimum size of not less than 10 kg or 140 cm in length.

The gears allowed for sport or recreational fishing are:

- lift nets with side not exceeding 6 mt;
- cast nets with a perimeter not exceeding 16 mt;
- fixed lines such as rods with no more than three hooks, hand lines, drifting lines with no more than six hooks, lines for cephalopods (no more than five fishing rods per each sport fisherman);

- surface and bottom trolling lines;
- hand harpoon, speargun - the activity can only be exercised in free diving; the activity is forbidden from sunset to sunrise; the diver must signal himself with a float bearing a red flag with white diagonal stripe visible at a distance of no less than 300 mt;
- rakes to be used by foot;
- longlines - no more than 200 hooks per boat regardless of the number of people on board; the ends of longlines must be marked with a yellow colored float with flag during the day and a light at night of the same colour, visible at a distance of not less than half a mile; same signals spaced no more than 500 mt;
- pots - no more than two pots per boat, regardless of people onboard; must be marked with a yellow colored float.

2.3.5 Acquaculture
2.3.5.a) Croatian Side

Aquaculture in the maritime domain of the Republic of Croatia can be performed pursuant to a permit for the performance of the aquaculture issued by the Ministry of Agriculture. The Aquaculture Act (NN 130/17, 111/18, 144/20) regulates the manner and conditions for the performance of the aquaculture activity and activities in breeding areas.

Sea aquaculture is determined by:

- the concession for economic exploitation of a maritime domain;
- installation of the breeding structures;
- change in the place allocation of a maritime domain;
- concentration of cultivated organisms.

Therefore, before obtaining a permit for aquaculture a range of criteria shall be met:

- the aquaculture zone must be foreseen in the spatial plan of the regional self-government;
- the location permit specifies conditions for the installation of breeding structures. In the process of obtaining a permit, among other things, the assessment of interventions on environment and nature, and compliance with the conditions of the sea safety jurisdiction are required (The Physical Planning Act NN 153/13, 65/17, 114/18, 39/19, 98/19);
- for interventions listed in the specific regulation (Regulation on environmental impact assessment; NN 61/14, 3/17) the evaluation procedure on the need for environment impact assessment intervention or environmental impact of aquaculture assessment are required (Environmental Protection Act NN 80/13, 153/13, 78/15, 12/18, 118/18; Nature Protection Act NN 80/13, 15/18, 14/19, 127/19);
- aquaculture implies commercial activity which requires excluding parts of the maritime domain from public use and giving concession to a holder for economic exploitation (Maritime Domain and Sea ports Act NN 158/03, 100/04, 141/06, 38/09, 123/11, 56/16, 98/19);
- aquaculture concession within 300 m zone from the coastline and up to 20 years is issued by the County, while aquaculture concession outside the 300 m zone from the coastline and/or for a longer period than 20 years is issued by the Government of the Republic of Croatia.

There is a fine line between fishing and some types of aquaculture, especially when the latter involves the collection of young breeding organisms for plantation from nature or the collection of organisms widely settled on purposely submerged artificial substrates (capture aquaculture). In addition, the manner of using the reefs for aquaculture pursuant to the legal framework is not very clear. It is theoretically possible to install an artificial reef in an aquaculture zone to improve the aquaculture or the environmental conditions in the aquaculture zone. That a completely innovative domain, and therefore legal ambiguities and difficulties are possible in realising such innovations. Natural reefs can be found within an aquaculture

zone, but it is not definite whether the natural reefs are the fundamental structure for performing aquaculture.

2.3.5.b) Italian Side

In Italy, aquaculture is subject to the rules governing state maritime property, through the granting of a concession. The competence for the concession issuing is regional and the technical offices responsible for the procedures provide the necessary forms, which can generally be downloaded online.

Usually, the application for the aquaculture concession must be submitted through the delivery of specific documentation which includes: chorography and planimetry of the area at the time of the request, as well as plan and detailed technical report of the project with the description of the employed materials and the indication on the restoration of the area at the end of the concession. Documents proving the transparency of the organisation and its conformity to Italian laws (e.g. no mafia activities) are required.

The Environmental Impact Assessment (EIA) is not mandatory but it can be requested by the regional body depending on the type and size of the project presented. If the project falls within a protected area (e.g. Natura 2000 site) or in its vicinity, the application must be integrated with the documentation necessary for the issuance of the authorization by the management body that must be involved in the evaluation of the project.

The current legislation, with some exceptions, governs aquaculture activities with an act of concession of the maritime state-owned areas. Normally the area is initially granted for a period of time not less than the amortisation time of the costs foreseen in the financial plan of the initiative.

The application evaluation process is generally structured as follows:

- preliminary activity to verify the completeness of the application;

- any request for additions necessary for a complete evaluation of the project;

- final provision with granting of the concession.

During the investigation, the responsible body convenes a service conference to acquire the opinions of all the other bodies involved. Very important is the opinion of the Port Authority, which issues a positive or negative opinion based on the impact of the project on the safety of navigation.

The aquaculture activity is subject to registration in the national registry of aquaculture companies managed by the Ministry of Health.

2.3.6. Risks posed by individual activities to reefs

The risk of using reefs, both natural and artificial, significantly determines their public use or the overlapping of competences. The natural properties of the reef can be the multiplier of the weakness of overlapping competences. That is in relation to the size of the reef (number of users at the same time) and the geomorphological (underwater walls) and biological diversity of the reef. The bigger and more diverse the reef is, the attractiveness for different types of users is potentially higher (diving, exploring, and fishing). Therefore, there is an overlap of authorities as well as of stakeholders.

The great attractiveness of a reef can affect the wider surrounding area. . For example, the users attracted by the reef need of areas for anchoring or mooring, which usually take place in close proximity and in shallow areas, with possible consequences on the habitats occurring over there.

a. Diving

A great number of diving groups on a reef site may have a harmful effect in terms of loss or damage of the present communities. Furthermore, anchoring close to the reefs, if not conducted professionally, can lead to the destruction of the physical structure and organisms on the reefs. The presence and increased traffic associated with the use of reefs can result in the introduction of invasive species in the reef area with possible negative effects on the local communities.

b. Research activities

Conducting research activities does not usually pose any danger to reefs if they are carried out using non-invasive methods and professionally, in accordance with the issued permits for research.

c. Commercial and non-commercial fishing

The use of trawl gears and purse seines for commercial fishing on the reefs or in their surroundings can be extremely harmful for the reef habitat and should be avoided. Set gears (nets, traps and hooks) positioned directly on the reefs may be stuck on the rocks/artificial substrates and, in the attempt to recover them; the fishers can damage the physical structure of the reef as well as the benthic communities settled on it. On the other hand, if the stuck gears are abandoned, they can continue fishing for a certain time.

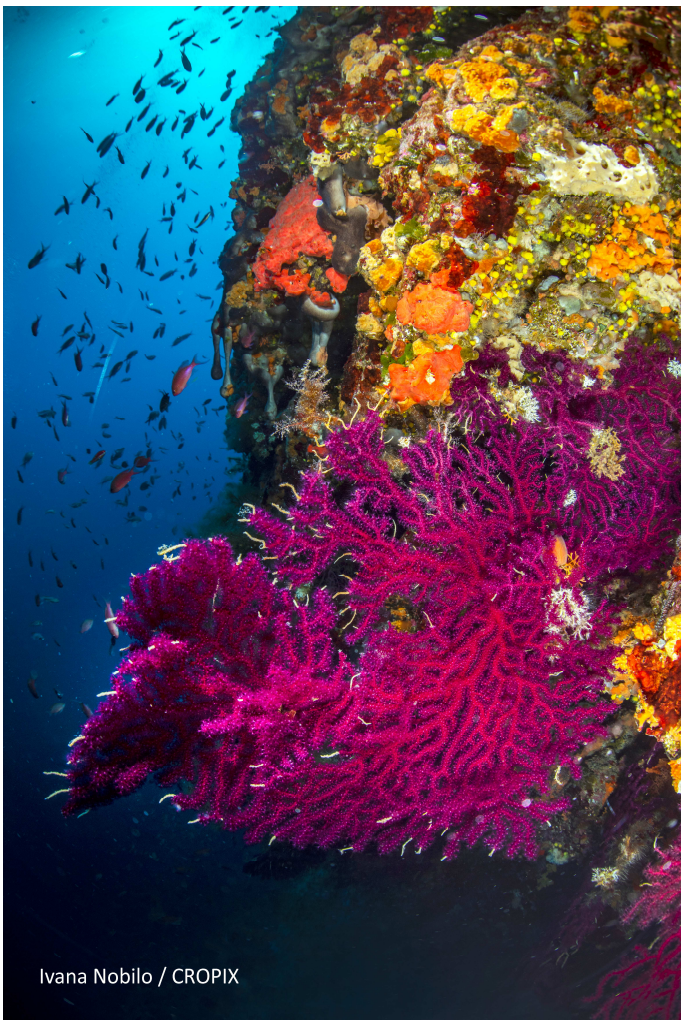
Also in this case anchoring the fishing boats close to the reefs, if not conducted professionally, can lead to the destruction of the physical structure and organisms on the reefs.

Moreover, the absence of management measures that regulate the fishing effort on the reef area, can lead to the overexploitation of the reef resources.

d. Aquaculture

Capture aquaculture represents the less harmful aquaculture activity that can be performed at a natural or artificial reef. However, also in this case, an excessive collection of the target species can lead to the depletion or heavy structural changes of the benthic communities settled on the hard substrates.

Intensive fish and shellfish aquaculture, instead, may be very harmful for the reef habitat due to the possible physical damages caused by the mooring of the culture structures (cages, long lines) as well as to the release of organic load from the farmed organisms and, in the case of fish farming, of drugs used to maintain the farmed fish healthy, which can alter the structure of the benthic and vagile wild populations inhabiting the reef. Another relevant factor that should not be ignored is the constant boat traffic required for the maintenance of the culture that can cause pollution at the reef site.



2.3.7 Risks posed by individual activities to users

In the absence of site-specific measures that regulate the access to a reef site, the simultaneous presence of too many stakeholders can generate congestion. This occurs when activities of different users interfere with each other and may result from either incompatible uses of the space (e.g. recreational and commercial fishing; commercial fishing, recreational fishing and diving) or incompatible fishing gears in a limited site.

In these cases, if the rules of the maritime traffic and safety rules for diving are not strictly respected, accidents to physical persons, gears and infrastructures may occur.

Divers visiting a reef site also exploited by commercial and recreational fishing can risk remaining entrapped in lost gears and, on the contrary, to damage the fishing gears. In addition, diving and fishing close to an aquaculture system requires great attention to avoid being entrapped in the culture structures or damage to them.

In the case of shipwrecks, movements of the structure can be extremely dangerous for divers, which are visiting it. Moreover, divers should pay great attention not to remain entrapped within the wreck.

2.3.8 An overview of the list of permits by activity

Activities performed on the reefs are related to the use of various vessels. In the case of a vessel owned by the transport service provider, the application of regulations related to the navigation is the service provider's concern. Except by organised transport, reefs can also be approached individually. In that case, it is using either your own vessel or the rented one. Navigation vessels have to be in good condition and have a valid licence. The person in charge of an operating vessel must have the required diploma or certificate proving the competence to operate the vessel of an appropriate category. Related information can be found in the competent Port authority.

Activities related to the use of reefs, in most cases, require appropriate permission for their performance (Table 2 and Table 3).

Table 2 An overview of activities and required permits for the use of reefs (Croatia)

Activity	The document proving the legality of conducting activities	Competent administration authority
Operating vessel	Required permit for vessel operation Vessel registered in the ship registry	Ministry of the Sea, Transport and Infrastructure/Competent port authority
Diving –individual **Diving – organised as a group and freediving**	Approval Approval	Competent port authority

Tourist diving	Approval	Competent port authority / Ministry of Tourism
Diving on cultural goods	Permission	Ministry of Culture and Media
Snorkelling	Not required	
Non-commercial fishing	Sports fishing permit	Sports fishing associations
	Recreational fishing permit	Fisheries administration – Ministry of Agriculture
Commercial fishing	Craftsman or company	Ministry of Economy and Sustainable Development
	Licence	Fisheries administration – Ministry of Agriculture
Aquaculture	Concession	Depending on conditions: County; Ministry of the Sea, Transport and Infrastructure; Government of the Republic of Croatia; The Croatian Parliament
	Permit	Fisheries administration – Ministry of Agriculture
Research activities Foreign legal and natural persons registered for conducting scientific research	Research register is certified by the competent operation manager	Ministry of the Sea, Transport and Infrastructure

In Italy the list of authorizations necessary for carrying out activities on the reefs in protected areas is subjected to the management plan of the individual sites, issued by the managing bodies.
In the reefs located in unprotected areas, the vessel must comply on board with the safety rules and with any indications of the navigation code of the local harbour master's office relating to the site concerned.

In Italy the competence for the implementation of productive activities in reef areas is split among numerous bodies and on different institutional levels (state, regional and local bodies), this overlap of competence complicates the procedures for obtaining the necessary authorizations.

Table 3 An overview of activities and required permits for the use of reefs (Italy)

Activity	The document proving the legality of conducting activities	Competent administration authority
Diving	The permit issued by the management authority of the area (in the case of protected area)	Management authority of (region, sea protected area, regional park, etc.) depending on the Management plan.

Activity	The document proving the legality of conducting activities	Competent administration authority
	In unprotected areas, special permit is not required. It is necessary to check restrictions of the site.	Competent port authority

In diving centres	Permit issued by the management authority of the area (in the case of protected area).	Management authority of (region, sea protected area, regional park, etc.) depending on the Management plan.
	In unprotected areas, special permit is not required. It is necessary to check restrictions of the site.	Competent port authority
Diving in the archeological sites	Permit issued by the management authority of the area (in the case of protected area).	Management authority of (region, sea protected area, regional park, etc.) depending on the Management plan.
	In unprotected areas, special permit is not required. It is necessary to check restrictions of the site	Competent port authority
Snorkelling, freediving	Permit issued by the management authority of the area (in the case of protected area).	Management authority of (region, sea protected area, regional park, etc.) depending on the Management plan.
	In unprotected areas, special permit is not required. It is necessary to check restrictions of the site	Competent port authority
Recreational fishing	Permit issued by the management authority of the area (in the case of protected area).	Management authority of the protected area depending on the Management plan.
	In unprotected areas, special permit is not required. It is necessary to check restrictions of the site	Competent port authority
Underwater recreational fishing	Permit issued by the management authority of the area (in the case of protected area).	Management authority of protected area depending on the Management plan.
	In unprotected areas, special permit is not required. It is	Competent port authority

	necessary to check restrictions of the site	
Commercial fishing	In addition to the professional licence, in the protected area the permit, issued by the management authority, is always required. In the unprotected areas is always necessary to check if there are restrictions due to navigation code	Ministry of Agriculture, Food and Forestry Policies - GeneralDirectorate for Sea Fishing and Aquaculture and Management authority of the protected area depending on the Management plan.
Aquaculture	Concession for the use of the state property and aquaculture licence	Ministry of Agriculture, Food and Forestry Policies - GeneralDirectorate for Sea Fishing and Aquaculture and a set of services monitored by the regional authority.
Research activities Foreign legal and natural persons registered for conducting scientific research	Approved project.	According to the type of activity:: - A set of services monitored by the regional authority. -Ministry of Agriculture, Food and Forestry Policies - GeneralDirectorate for Sea Fishing and Aquaculture

2.4 Criteria for selection of the location for the use of reefs for the Blue economy

When considering the criteria for the use of reefs, it is necessary to take into account the geographical position, ecological features, and traffic connection of the location, which significantly determine the use of the location for various activities.

Uses and socio-economic aspects of the local communities should be also analysed in order to develop new activities which may involve the overall working population, acting as a generator of employment, and be connected in a synergic way with the existing ones in order to implement and diversify the offer of services the site can provide especially from the touristic point of view.

Local small-scale fishing communities could get profits by the development of new activities in line with the Blue growth such as diving, recreational fishing and capture aquaculture as they could differentiate/integrate their fishing activity with the new ones (e.g. fishing tourism).

Special attention should be paid to the restrictions of the use and allocation of space, as well as the presence of fishing and aquaculture. If the future location is in an area with certain space restrictions, for example, a certain category of a protected area according to the Nature protection act, or under the movement restriction (the closeness of the seaway, military zone), possible advantages and/or disadvantages of some restrictions should be considered when planning the use of reefs.

A potential productive development, couldntegrate multiple economic activities on a single reef. Some entrepreneurial activities, in fact, could be complementary to each other. The sustainability of a multi-activity project should be however detectable both at an environmental level and at an economic level in order to avoid conflicts for space and resources

Several basic management options for artificial reefs, which can also be applied to natural reefs, are proposed by FAO (2015):
1) Selective access control: it may consist in the establishment of property or user rights whereby local fishers communities or recreational associations would be co-responsible with government agencies for regulating access and monitoring both the activities which are carried out at the artificial reef and the physical performance of the reef structures. It is often not feasible due to political and institutional constraints that explicitly forbid discrimination between different groups of users.

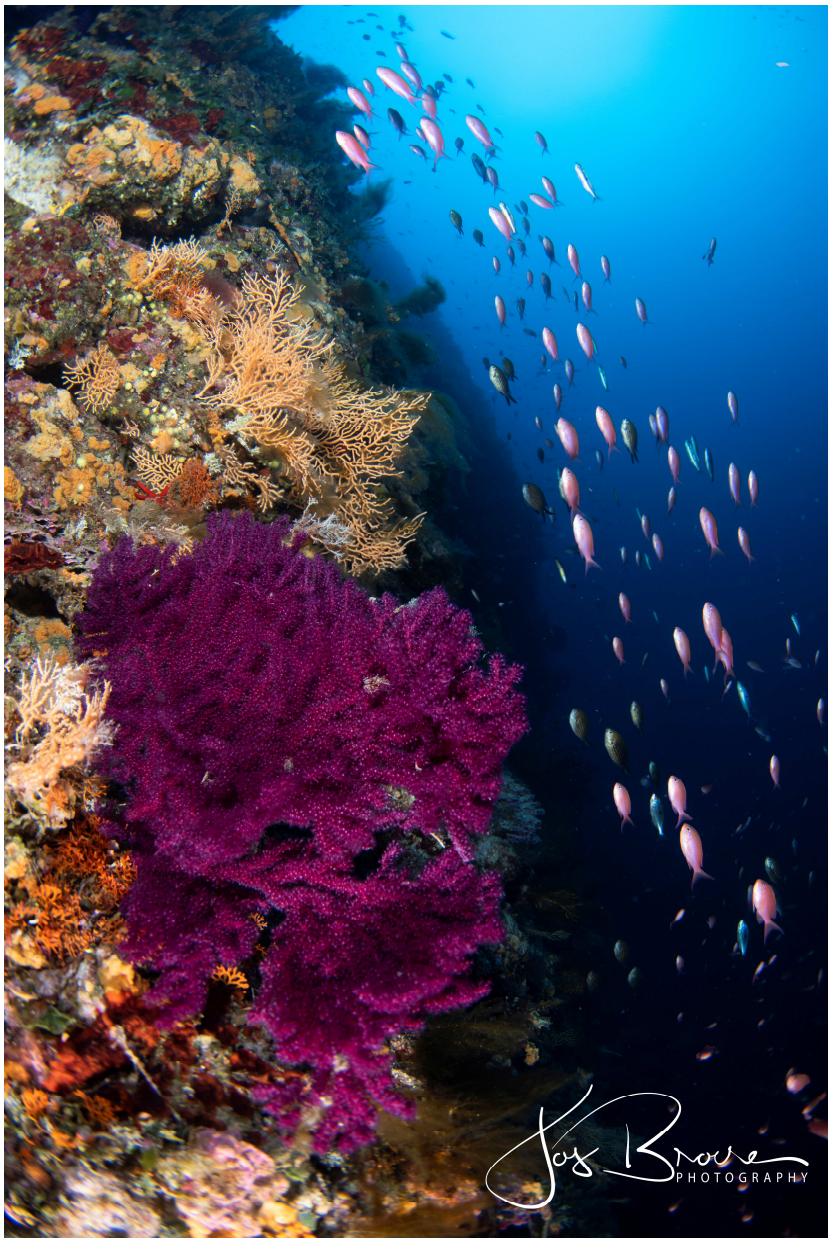
2) Gear and catch restrictions: this measure is aimed to orient harvesting strategies at the reef by selective fishing gears so to allow optimal fishing yields and avoid disruption of the natural succession of the reefs and associated assemblages. Exploitation strategies should include different types of fishing gear to diversify the catches and exploit all the reef resources to avoid alterations in the equilibrium among the functional groups of fish and macroinvertebrates inhabiting the reef.

3) Temporal closure: it can be adopted to avoid the exploitation of the reef resources in particular seasons of the year, for example to favour the reproduction and/or the early growth of juveniles at the reef, but this measure may increase congestion and overexploitation in the remaining periods.

4) Temporal segregation of users: it is aiming at separating user groups allocating specific periods of time when each group is permitted access. Times may be chosen based on various factors such as stock availability, weather conditions, market prices, etc. In this way, the different user groups can continue to use the artificial reef without interacting between them. However, this management measure is easily enforceable only when the different user groups (e.g. recreational and professional fishers) are easily distinguishable and compliance resources permit. In addition, similar to closed seasons, the reef may increase congestion within user groups because access opportunities for each of them are compressed into shorter periods.

5) Spatial segregation of users: it consists in creating separate reef sites for each user group. Nevertheless, maintaining multiple reefs is much more expensive than other control options and can actually increase

the likelihood of conflict if perception of better catch rates on one reef over another is reported, with fishers moving without consent onto another reef sector.
However, no single management system can be optimal for all situations and the choice of one or more options must be based on the nature of the reef, the ecosystem services it can offer and the categories of potential users and conflicts, as well as the effectiveness of the management options adopted.



The case studies considered in the ADRIREEF project encompassed 8 locations in the Adriatic Sea, and examined different spatial, economic, and social data intending to connect the use of reefs and ecosystem services they provide (tables 3-6; Stenek, 2019).

Table 3 Analysis of the criteria for the pilot area Plič Konjsko

Criterium	**PLIČ KONJSKO**
Depth	5,5 – 18 m
Type	shoal/reef
Distance from mainland	200 m island of Krk
Zone of impact	Municipalities Dobrnj i Vrbnik (island of Krk)
Wide zone of impact	Vinodol channel
The use of reef	Diving, fishing
Within the ecological network	POP HR1000033 Kvarner islands
Other areas of EN within 2km	POVS HR2001357 Island of Krk (mainland); HR3000029 Coast between cape Šilo and Vodotoč (reefs)
Within PA	NO
Other sites of PA within 2 km	Important landscape and nature monument proposed for protection
Within the protected cultural heritage zone	NO
Proximity to estuary	NO
Conducted research	NO
Established monitoring (biodiversity, sea quality, etc.)	Bathing water quality cca 700m (S)
Population	3.338 Dobrinj i Vrbnik (Dobrinj 2.078)
Share of elderly population	33,5 %
Share of the working age population	63,7 %
Total entrepreneurship income	862.574.000 kn
The most significant activity	Specialised construction activities
Total revenues of the blue economy	23.966.489 kn
Share of BE revenues in total revenues	2,8 %
The most significant activity of BE	Travel agencies, tour operators
Number of employees	228
Share of blue economy employees	21,9 %
Average salary	4.918 kn
Average salary in BE	3.219 kn
Number of trades	333
Share of agriculture trades in total number	9,9 %
Existing uses on the nearest mainland	Tourist zone and beach
Planned uses on the nearest mainland	Tourist zones
Impact of maritime traffic	NO
Notable attractions nearby	Medicinal mud in the bay Soline
Total accommodation capacity	9.139
Average occupancy	15,6 %
Average length of stay	6,5
Tourist trends	↑ 5 %
Number of diving centres	8
Number of nautical berths and buoys in the narrow area	49
Number of fishing authorisations	13 Dobrinj and Vrbnik (35 in the wide zone)
Number of small-scale coastal fishing authorisations	5 Dobrinj and Vrbnik (8 in the wide zone)
Authorisation for fishing tourism	NO
Distance from existing or planned mariculture	cca 13,5 km (SE – N. Vinodolski), planned

Criterium	PLIČ KONJSKO
Capacities and types	Polyculture
Special restrictions	Many interesting diving locations nearby
Possible opportunities	- Primarily tourist area - Proximity to coast and shallow depth - Planned construction of the Diving centre in Vrbnik (diving museum, gallery, and diving infra and suprastructure)

Table 4 Analysis of the criteria for the pilot area Lagnići

CRITERIUM	LAGNIĆI
Depth	4 – 45 m
Type	shoal/reef
Distance from mainland	1000 m island of Dugi otok
Zone of impact	NW part of Dugi otok, Veli Rat
Wide zone of impact	Municipality Sali
The use of reef	Diving, fishing
Within the ecological network	POP HR1000034 North part of the archipelago of Zadar POVS HR3000067 Luka Soliščica (sea)
Other areas of EN within 2km	POVS HR3000068 Bay Golubinka - cape Lopata (reefs); HR3000419 J. Molat-Dugi-Kornat-Murter-Pašman-Ugljan-Rivanj-Sestrunj-Molat (reefs)
Within PA	NO
Other sites of PA within 2 km	Important landscape the north-west part of Dugi otok
Within the protected cultural heritage zone	NO
Proximity to estuary	NO
Conducted research	Biodiversity of west wall and posidonia
Established monitoring (biodiversity, sea quality, etc.)	NO
Population	1.698 Sali (100 Verunić and Veli Rat)
Share of elderly population	44 % (77 % Veli Rat)
Share of the working age population	56 % (38 % Veli Rat)
Total entrepreneurship income	110.100.726 kn
The most significant activity	activities of processing and preservation of fish, crabs and mussels
Total revenues of the blue economy	66.350.319 kn
Share of BE revenues in total revenues	60,3 %
The most significant activity of BE	activities of processing and preservation of fish, crabs and mussels
Number of employees	289
Share of blue economy employees	60,2 %
Average salary	4.474 kn
Average salary in BE	3.970 kn
Number of trades	256
Share of agriculture trades in total number	25,4 %
Existing uses on the nearest mainland	No
Planned uses on the nearest mainland	Tourist zone – camp
Impact of maritime traffic	YES, high intensity
Notable attractions nearby	Boat Michelle, lighthouse Bjanka, Saharun beach, a mine from the II World War in the bay, Important landscape
Total accommodation capacity	1.311 NW part of the island (422 Veli Rat)
Average occupancy	26,4 % (21,7 %)
Average length of stay	n/p
Tourist trends	↑↓
Number of diving centres	3

CRITERIUM	LAGNIĆI
Number of nautical berths and buoys in the narrow area	303
Number of fishing authorisations	8 west part of the island (31 in the wide zone)
Number of small-scale coastal fishing authorisations	7 west part of the island (34 in the wide zone)
Authorisation for fishing tourism	3
Distance from existing or planned mariculture	cca 7,5 km (NO – island of Zverinac)
Capacities and types	Tuna 1,5t
Special restrictions	- The use of fishing gear of tramata fishing net and lampra net in the area – Intensive maritime traffic – Deficiency of drinking water and electricity limit development
Possible opportunities	- Redirect diving activities from other areas of Natura 2000 where diving is considered harmful, and today are used intensively - Combining with tuna breeding on Zverinac (distance cca 7 km) - Boat Michelle visible on the surface - Proximity to Saharun beach - The proximity to Telašćica and Kornati attracts nature lovers - Big capacities of nautical tourism

Table 5 Analysis of the criteria for the pilot area Plič Seget

CRITERIUM	PLIČ SEGET
Depth	10 – 30 m
Vrsta	reef
Distance from mainland	2,8 km island of Vis
Zone of impact	City of Komiža
Wide zone of impact	Island of Vis
The use of reef	Diving, fishing
Within the ecological network	POVS HR3000469 Vis water area (bottlenose dolphin)
Other areas of EN within 2km	POVS HR3000097 Island of Vis-underwater (reefs)
Within PA	NO
Other sites of PA within 2 km	UNESCO Geopark Vis archipelago, WWF Adriatic Blue Corridor
Within the protected cultural heritage zone	NO
Proximity to estuary	NO
Conducted estuary	NO
Established monitoring (biodiversity, sea quality, etc.)	NO
Population	3.460 (1.526 Komiža)
Share of elderly population	31 % Komiža
Share of working age population	66 % Komiža
Total entrepreneurship income	96.238.027 kn
The most significant activity	sports, entertainment and recreational activities
Total revenues of the blue economy	38.976.657 kn
Share of BE revenues in total revenues	40,5 %
The most significant activity in BE	sports, entertainment and recreational activities
Number of employees	299
Share of blue economy employees	41,1 %
Average salary	4.687 kn
Average salary in BE	4.271 kn
Number of trades	260
Share of agriculture trades in total number	18,5 %
Existing uses on the nearest mainland	No

CRITERIUM	PLIČ SEGET
Planned uses on the nearest mainland	No
Utjecaj Impact of maritime traffic	YES, moderate intensity
Notable attractions nearby	Plič Seget is an old vulcano
Total accommodation capacity	5.607 (2.579 Komiža)
Average occupancy	13,9 % (11,7 % Komiža)
Average length of stay	6
Tourist trends	↑
Number of diving centres	5
Number of nautical berths and buoys in the narrow area	94
Number of fishing authorisations	63 Komiža (86 island of Vis)
Number of small-scale coastal fishing authorisations	9 Komiža (11 island of Vis)
Authorisation for fishing tourism	2 Komiža (3 island of Vis)
Distance from existing or planned mariculture	NO
Capacities and types	NO
Special restrictions	- strong currents
Possible opportunities	- vulcano, eruptive history

Table 6 Analysis of the criteria for the pilot area Sika od Stupišta

CRITERIUM	SIKA OD STUPIŠTA
Depth	7 (17) – 50 m
Type	reef
Distance from mainland	300 m island of Vis
Zone of impact	City of Komiža
Wide zone of impact	Island of Vis
The use of reef	Diving
Within the ecological network	POVS HR3000097 Island of Vis-underwater (reefs)
Other areas of EN within 2km	POVS HR3000469 Vis water area (bottlenose dolphin); POP HR1000039 Pučinski islands
Within PA	NO
Other sites of PA within 2 km	UNESCO Geopark Vis archipelago, WWF Adriatic Blue Corridor
Within the protected cultural heritage zone	NO
Proximity to estuary	NO
Conducted research	NO
Established monitoring (biodiversity, sea quality, etc.)	NO
Population	3.460 (1.526 Komiža)
Share of elderly population	31 % Komiža
Share of the working age population	66 % Komiža
Total entrepreneurship income	96.238.027 kn
The most significant activity	sports, entertainment and recreational activities
Total revenues of the blue economy	38.976.657 kn
Share of BE revenues in total revenues	40,5 %
The most significant activity of BE	sports, entertainment and recreational activities
Number of employees	299
Share of blue economy employees	41,1 %
Average salary	4.687 kn
Average salary in BE	4.271 kn
Number of trades	260
Share of agriculture trades in total number	18,5 %

CRITERIUM	SIKA OD STUPIŠTA
Existing uses on the nearest mainland	Special purpose zone of MoD
Planned uses on the nearest mainland	Special purpose zone of MoD
Impact of maritime traffic	YES, medium moderate intensity
Notable attractions nearby	Military zone, former missile base
Total accommodation capacity	5.607 (2.579 Komiža)
Average occupancy	13,9 % (11,7 % Komiža)
Average length of stay	6
Tourist trends	↑
Number of diving centres	5
Number of nautical berths and buoys in the narrow area	94
Number of fishing authorisations	63 Komiža (86 island of Vis)
Number of small-scale coastal fishing authorisations	9 Komiža (11 island of Vis)
Authorisation for fishing tourism	2 Komiža (3 island of Vis)
Distance from existing or planned mariculture	NO
Capacities and types	NO
Special restrictions	- for all the planned activities, it is necessary to apply for approval of MoD. - Natura 2000 area in which the goal is protecting the reef and diving is identified as a threat
Possible opportunities	- biodiversity conservation due to the restricted access and proximity to the military zone, and prohibition of spearfishing with the light

Table 7 Analysis of the criteria for the pilot area Torre Guaceto.

Total entrepreneurship income	NA
The most significant activity	Small- scale professional fishing
Total revenues of the blue economy	NA
Share of BE revenues in total revenues	NA
The most significant activity of BE	Tourism, Research
Number of employees	NA
Share of blue economy employees	NA
Average salary	NA
Average salary in BE	NA
Number of trades	?
Share of agriculture trades in total number	?
Existing uses on the nearest mainland	Beach, Small Port,Terrestrial natural reserve
Planned uses on the nearest mainland	AMP
Impact of maritimetraffic	?
Notable attractions nearby	**errestrial Natural Reserve, historical centre of Brindisi, archeological area of Santa sabina**
Total accommodation capacity	7.634 Carovigno 3.0976 Brindisi **3.8610 Total area**
Average occupancy	NA
Average length of stay	3 DAYS
Tourist trends	NA
Number of diving centers	3
Number of nautical berths and buoys	0 for the case study area
Number of fishing authorisations	0 for the case study area
Number of small-scale coastal fishing authorisations	5 for the case study area
Authorisations for fishing tourism	0 for the case study area
Distance from existing or planned mariculture	Not intended for the case study area

Capacities and types	NA
Special restrictions	AMP plan rules
Possible opportunities	- recreational scuba diving - scientific research - citizen science - ocean literacy - tourism

Table 8 Analysis of the criteria for the pilot area Trezza San Pietro.

Total entrepreneurship income	? €
The most significant activity	Tourism, Manufacturing sector, Building, Fishery
Total revenues of the blue economy	?
Share of BE revenues in total revenues	? %
The most significant activity of BE	Tourism, Small scale fishery
Number of employees	?
Share of blue economy employees	? %
Average salary	Mean salary in the towns of the area in 2009: 20,415 €/year/person (Mean salary in Italy in 2009: 22,891 €/year/person)
Average salary in BE	?
Number of trades	Total number of active enterprises in the coastal area in 2010:: 6,017 (16.18% Agriculture; 21.32% Industries; 62.49% Services)
Share of agriculture trades in total number	16.18%
Existing uses on the nearest mainland	Tourism developed on beach, small scale fishery
Planned uses on the nearest mainland	Tourism developed on beach, small scale fishery
Impact of maritime traffic	Mainly linked to the movements of the fishing fleet and to the summer craft pleasure.
Notable attractions nearby	Aquileia archeological site; Grado and Marano lagoons Grado and Marano towns are cultural heritage; Grado beach; Lignano Sabbiadoro beach; Regional Natural Reserve Valle Cavanata; Natural Reserve Foci dell'Isonzo; Natural Reserve Foci dello Stella; Zoological Park Punta Verde di Lignano; Tagliamento natural riverbed.
Total accommodation capacity	In 2011 the citizens of Grado were 8,611 and the accommodation capacity amounted to 22,.457 beds. In the whole area there were 58,533 inhabitants and 88,283 beds.
Average occupancy	In 2010 in Grado arrivals were 207,163 (+4%), presences were 1.423.830 (-4%). In 2010 in the whole area arrivals were 291.404 (+24,33%), presences were 1,814,485 (+60%).
Average length of stay	6,87 days in Grado;6,29 days mean of the towns in the area (data referred to 2010)

Tourist trends	See above
Number of diving centers	13 diving centers in the area
Number of nautical berths and buoys in the narrow area	In 2011 in Grado there were 3,040 nautical berths, in the whole area there were 10,527 nautical berths. In 2011 10,.500 boats, mainly under 6 mt LOA, were present lin the whole area besides . 236 fishing boats.
Number of fishing authorisations	In 2004 in Grado there were 66 fishing boats. In the whole area, the total number of fishing boats was 236.
Number of small-scale coastal fishing authorisations	In 2015, there were 60 licences for small-scale coastal fishing in Grado and 90 in Marano Lagunare, the two main fishing harbours of the area.
Authorisations for fishing tourism	In the last 5 years, there was 1 authorisation for Grado and 3 authorisations for Marano Lagunare, the two main fishing harbours of the area.
Distance from existing or planned mariculture	around 9 km (coast line) from existing extensive mariculture carried out in the Grado and Marano lagoon
Capacities and types	Extensive mariculture in the lagoon: Manila clam (*Ruditapesphilippinarum*), Seabass (*Dicenthrarcuslabrax*), Golden seabream (*Sparusaurata*), Greymullets (Mugilidae various species).
Special restrictions	The Study Case is a Site of Community Importance since 2014 and fishing is forbidden in almost half of the area (where rocky bottoms are present).
Possible opportunities	- extremely interesting touristic area with different opportunities; - the low depth allows diving even for non-experts; - the Study Case is just one of the numerous similar rocky outcrops where it could be possible to develop diving tourism and fishing tourism

Table 9 Analysis of the criteria for the pilot area Artificial Reef Porto Recanati – Potenza Picena (Marche Region).

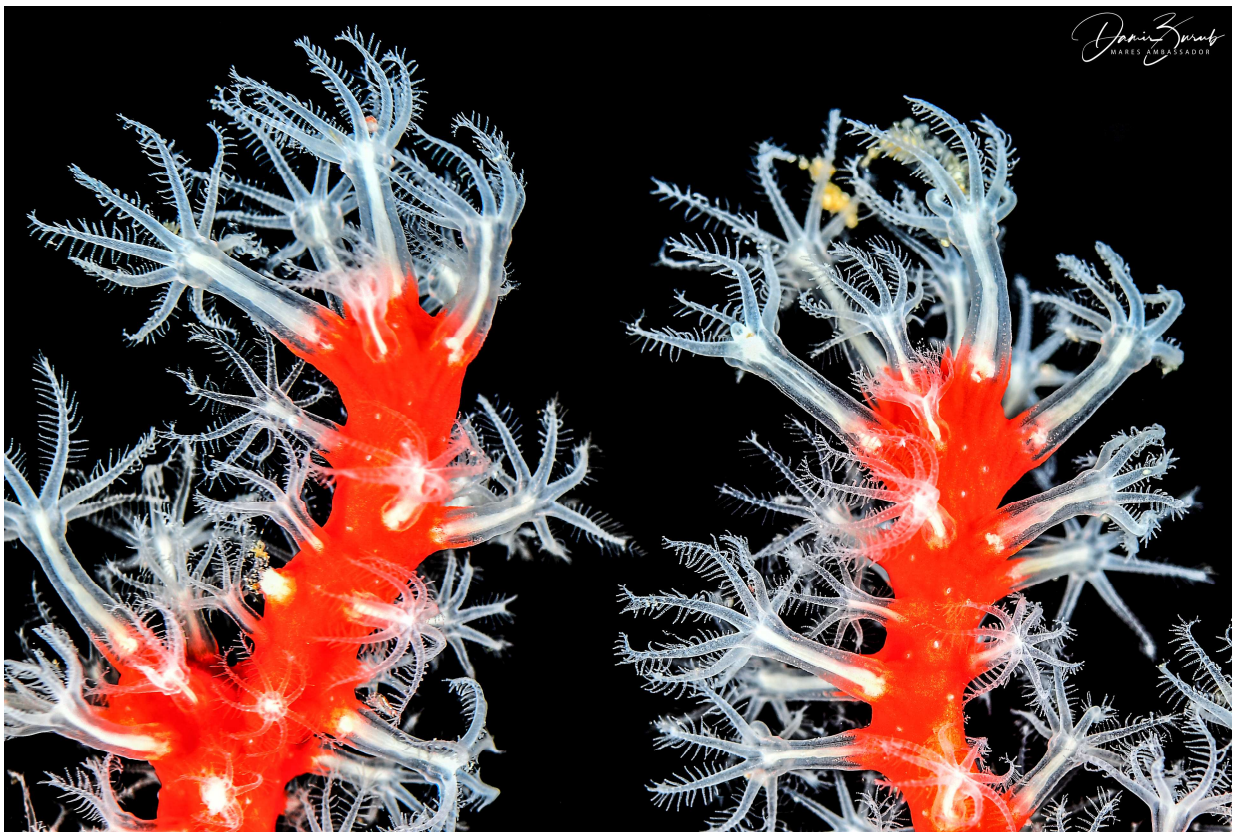
Total entrepreneurship income	7,475,825 €
The most significant activity	Tourism sector
Total revenues of the blue economy	NA
Share of BE revenues in total revenues	NA
The most significant activity of BE	COASTAL TOURISM
Number of employees	NA
Share of blue economy employees	NA
Average salary	NA
Average salary in BE	NA
Numberoftrades	?
Shareofagriculturetradesin total number	?
Existing uses on the nearest mainland	Touristic zone and beach - port activities
Planned uses on the nearest mainland	Touristic zone and beach - port activities
Impact of maritimetraffic	?
Notable attractions nearby	Conero Regional Park; Recanati historical center; Sanctuary of Loreto
Total accommodation capacity	9,742 Porto Recanati 3,359 Porto Potenza Picena 792 Recanati

	13,897 Total area
Average occupancy	NA
Average length of stay	NA
Tourist trends	-13.2% of accommodation capacity from 2019 to 2020
Number of diving centers	3
Number of nautical berths and buoys	?
Number of fishing authorisations	NA
Number of small-scale coastal fishing authorisations	25
Authorisations for fishing tourism	NA
Distance from existing or planned mariculture	Minimum distance: ~ 430 m from the western side of the AR and ~ 600 m from the northern side
Capacities and types	Type: shellfish culture on longlines Capacity: NA
Special restrictions	The public body responsible for the management is the Marche Region. To date, the Region has not adopted any management plan for the Porto Recanati – Porto Potenza Picenaartificial reef. Therefore, the site does not have a local legal framework. The lack of de facto regulation permits forms of economic exploitation such as fishing, extractive aquaculture consisting in the collection of wild mussels settled on the artificial substrates, and tourism. Intensive aquaculture is not allowed at the reef which is out of the farming areas established by Marche Region. Now, it does not seem to be possible to move towards a regulatory framework, even if the activities carried out in the ADRIREEF project may open the discussion and force the regulatory body to introduce a regulatory framework.
Possible opportunities	- recreational fishing; - professional small-scale fisheries; - mussel harvesting (capture aquaculture); - diving.

Table 10 Analysis of the criteria for the pilot area Paguro wreck.

Total entrepreneurship income	NA (Not Available)
The most significant activity	Manufacturing Industry
Total revenues of the blue economy	NA
Share of BE revenues in total revenues	NA
The most significant activity of BE	TOURISM
Number of employees	NA
Share of blue economy employees	NA
Average salary	NA
Average salary in BE	NA
Number of trades	?
Share of agriculture trades in total number	?
Existing uses on the nearest mainland	Touristic Zone and beaches – Port Activities
Planned uses on the nearest mainland	Touristic Zone
Impact of maritime traffic	In 2019 in the port of Ravenna 26.256.248 tons of goods and about 17.000 cruise passengers passed through
Notable attractions nearby	Ravenna City with its cultural heritage, Po Delta Park

Total accommodation capacity	55.406 (dati 2021)
Average occupancy	NA at the moment
Average length of stay	4.55 DAYS
tourist trends	-39 % (2020 vs 2019 due to COVID impact)
Number of diving centers	3
Number of nautical berths and buoys	4 for the case study area
Number of fishing authorisations	0 for the case study area
Number of small-scale coastal fishing authorisations	0 for the case study area
Authorisations for fishing tourism	0 for the case study area
Distance from existing or planned mariculture	Not ruled for case study area
Capacities and types	NA
Special restrictions	Management plan rules
Possible opportunities	- recreational scuba diving - scientific research - ocean literacy - virtual tourism - multi reef activity



List of regulations

Croatia

- Nature Protection Act (NN 15/18, 14/19, 127/19)
- Environmental Protection Act (NN 80/13, 153/13, 78/15, 12/18, 118/18)
- Act on the provision of tourism services (NN 130/17, 25/19, 98/19, 42/20 i 70/21)
- Marine Fisheries Act (NN 62/17, 130/17, 14/19)
- The Physical Planning Act (NN 153/13, 65/17, 114/18, 39/19, 98/19)
- Maritime Domain and Sea ports Act (NN 158/03, 100/04, 141/06, 38/09, 123/11, 56/16, 98/19)
- Maritime Code (NN 181/04, 76/07, 146/08, 61/11, 56/13, 26/15, 17/19)
- Regulation on environmental impact assessment (NN 61/14, 3/17)
- Regulation on conducting underwater activities (The Official Gazette, NN 47/99, 23/03, 28/03, 52/03, 58/03) and by Decision to repeal the Article 5, of the Article 5a, paragraph 2 and Article 8 of the Regulation on conducting underwater activities (NN 96/10).
- Ordinance on the Procedure and Manner of issuing permits for undertaking underwater activities in the Inner Sea and Territorial Sea of the Republic of Croatia, which excludes areas in which there is cultural heritage, and for which specific permit shall be obtained (NN 49/19, ispr., 55/19)
- Ordinance on sports and recreational fishing at sea (NN 122/17, 12/18, 54/18, 69/20, 125/20 i 87/21)
- Regulation on fishing in protected areas, special habitats and areas with special fishing regulations (NN 125/2020)

Italy

- Decree of the President of the Republic 2 October 1968, n. 1639 “Regolamento per l'esecuzione della legge 14 luglio 1965, n. 963, concernente la disciplina della pesca marittima.”
- Ministerial decree 29 July 2008, n. 146 “Regolamento di attuazione dell'articolo 65 del decreto legislativo 18 luglio 2005, n. 171, recante il codice della nautica da diporto.”
- Decree of the Ministry of Sustainable Infrastructure and Mobility 1 September 2021 “Requisiti, formalità ed obblighi da ottemperare per l’utilizzazione dei natanti da diporto ovvero delle moto d’acqua ai fini di locazione o di noleggio per finalità ricreative o per usi turistici di carattere locale, nonché di appoggio alle immersioni subacquee a scopo sportivo o ricreativo nelle acque marittime e interne.”
- Deliberazione della Giunta Regionale 22 novembre 2019, N. 2360 - "Direttive per l'esercizio delle funzioni amministrative in materia di demanio marittimo e di zone del mare territoriale ai sensi dell'art. 3, comma 1 della L.R. 31/05/2002, n. 9."

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